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An Account of some Observations lately made at Nurenburg by Mr. P. Wurtzelbaur, shewing that the Latitude of that Place has continued without sensible alteration for 200 Years last past; as likewise the Obliquity of the Ecliptick; by comparing them with what was observed by Bernard Walther in the Year 1487, being a Discourse read before the Royal Society in one of our late Meetings.

WHETHER the Poles and Axis of the Earth be really fixt in the Globe, or subject to be transferred from place to place is an old Enquiry, though now lately revived by Mr. Hook in his ingenious essays upon the great mutations and *Catastrophies* which in all appearance have hapned to the Earth's Surface. A necessary consequence of such a translation of the Poles would be the change of the Latitudes of places, which would encrease in those Regions towards which the Poles approach, and decrease in those from which they recede: and under the Meridian 90 degrees removed from that in which the Poles shift, the Latitudes continuing the same, the Meridian Line would only alter; but no two places considerably differing in Latitude can be supposed, wherein if there be any sensible motion of the Poles, it shall not be perceived by the alteration of the Latitude of one or both of them.

The accurate Mr. *Wurtzelbaur*, has lately furnished us with the means of examining this Hypothesis by observation, having sent us the Meridian Altitudes of the Sun taken at *Nurenburg* about the two Solstices in the Year 1686. *June* the 10th. he found the Meridian Altitude of ☉ 64gr. 2m. 20s. and the next Day 64gr. 2m. 25s. and on *December* 14^o. 3 days after the Solstice, wherein the Sun was got two minutes higher, he found the Meridian Altitude 17gr. 9m. 1cs.

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wherefore the solstitial Altitude was $17^{\text{gr.}} 7^{\text{m.}} 10^{\text{s.}}$ These heights were taken by an Instrument of 6 foot Radius of Brads; and the skill and diligence of the observer is not to be doubted.

To compare with these I find among *Bernard Walkers* observations made in the same City of *Nurenburg*, two hundred Years before, *viz.* in the Year 1487, that the Meridian Altitude of the Sun in the summer Solstice was observed by the Parallaſtick instrument of *Ptolomy*, whereby the Chord of the Suns distance from the Zenith was observed 44890 parts of 100000 *Radius*; the same being confirmed by the concurrence of the observations of several Years both before and after. The arch answering to this Chord gives the Suns distance from the Zenith $25^{\text{gr.}} 56^{\text{m.}} 30^{\text{s.}}$ and consequently the Meridian Altitude its Complement to a Quadrant, $64^{\text{gr.}} 3^{\text{m.}} 30^{\text{s.}}$ Again, the same Year 1487, the Chord of the Meridian distance of \odot from the Zenith, on the day of the Winter solstice was found 118790, confirmed likewise by many subsequent observations; the arch answering to this Chord is $72^{\text{gr.}} 52^{\text{m.}} 40^{\text{s.}}$ and its complement $17^{\text{gr.}} 7^{\text{m.}} 20^{\text{s.}}$ the Meridian hight of the Sun in the Winter solstice.

Hence it appears that the solstitial hights were very nearly the same at *Nurenburg* 200 Years ago as now they are, that of the Summer solstice being but one minute differing, the other only 10s. both which may possibly arise from the defects of the Instruments of these observers, being made with plaine sights; but what I shall necessarily conclude from hence is, that if there be such a motion of the Poles, it is either very slow, or else nearly at right angles to the Meridian of *Nurenburg*; in which latter case the Latitudes of places about *Tunking*, *Siam*, *Malacca* and *Java* on the one side, and in our *American* plantations of *New-England*, *Virginia*, *Jamaica* &c. on the other, ought to change fastest; but I have never yet heard of any such thing by any of our Navigators; whence if there be such a change of the Earths Poles, it must necessarily require a long time to become sensible.

Besides

Besides, from these Observations it appears that the obliquity of the Ecliptick has continued unaltered for these 200 Years last past, that is to say, that the Angle which the Earths Axis makes with the plane of the Ecliptick or Orb wherein she moves annually round the Sun, has been without sensible Change in all that time; which will be very hard to conceive, if we allow a translation of the Earths Poles; for the direction of the Axis being perfectly at Liberty, it must be purely casual, if it so hit, that after such change, it make the same Angle with the Ecliptick as before.

A farther argument of this slowness of the change of the Poles is the Latitude of *Alexandria*, the habitation of those Famous *Astronomers* of antiquity *Eratosthenes*, *Timocharis*, *Hipparchus* and *Ptolomy*, and for that reason it may be concluded that this of all the Latitudes the ancients has left us, ought to be one of the most correct. This by *Ptolomy* is said to be 30gr. 58m. North, (which he uses in all his computations in his *Almagest*, and seems derived from the proportion of the *Gnomon* to its Equinoctial shadow, as 5 to 3) but in his *Geography*, 31gr. just. In the Year 1638 the curious and Ingenious Mr. *Greaves*, when he went to visit the *Egyptian Pyramides*, of which he has given so good an account, did with a sufficient Instrument observe the Latitude of *Alexandria*, and found it 31gr. 4m. or 6 minutes more than it is reputed by *Ptolomy*, and before him by *Eratosthenes*; so that in about 2000 Years the Latitude of *Alexandria* has altered only a few minutes, and so few that the accuracy of the observations of the ancients may well be questioned: But both being granted, this motion will amount to no more than a degree in 20000 Years.

This is said not with intent to invalidate what Mr. *Hook* hath from so good grounds advanced, *viz.* that the Ball of the Earth, at least the fluids thereof, being necessarily of the Figure of a *Sphaeroides prolatus*, or flat Oval, whose shortest diameter is the Axis, and greatest Circle the Equinoctial; if the Poles be supposed changed, the Equinoctial will be so

too; and consequently the Water must rise and cover those parts from which the Poles recede, and fall off and leave bare those places towards which the Poles approach. By this means it may be accounted for, how such strange marine things are found on the tops of hills, and so deep under ground; and scarce any other way. But from these and the like observations it will follow, that if these inundations are produced by any regular motion of the Poles, it would require a prodigious number of Ages to effect those changes we may be certain have been. Besides, if the access and recess of the Sea were after such a gradual manner, as when produced by such an easie translation of the Poles, as can by observation be admitted, those Inundations could never be fatal to the Inhabitants, for that they would always give notice of their Coming, so that the People might provide for their safety. But the Holy *Scriptures* and Pagan Tradition do unanimously agree, that the last great Deluge was brought to pass in a few days, with no previous notice, so that the account we have thereof, could not by this Hypothesis be made out, without the supposition of a great and sudden alteration in the Poles of the Earths diurnal Revolution; for which whether we should have recourse to the Intelligent powers that first impress this whirling motion on the Ball, or leave it to be performed naturally, by the casual Choc of some transient body, such as a Comet or the like, whereby the former Axis might be lost and a new Revolution produced, differing both in time and position from the old; I shall not undertake to dispute: such a supposition would include likewise a change of the length of the Year and Eccentricity of the Earths Orb; for which yet we have no sort of Authority.
